AMENDMENTS TO THE CLAIMS

Claims 1-19   (Canceled).

20.   (Currently amended) A method for improving the measurement of one or more types of specific particles of a sample using a detector associated with a biological analysis system wherein the specific particles are adapted to emit identifiable signals based on the interaction of the specific particles with corresponding probes and wherein the identifiable signals are captured by the detector to yield an output signal and wherein the detector is adapted to be operated at different configurations that respond differently to the identifiable signals, the method comprising:

performing a first measurement of the identifiable signals with the detector at a first configuration such that the detector yields a first output signal wherein the first configuration allows effective measurement of a first type of the specific particles, wherein the first configuration includes a first operating parameter of the detector;

performing a second measurement of the identifiable signals with the detector at a second configuration such that the detector yields a second output signal wherein the second configuration allows effective measurement of the second type of the specific particles, wherein the second configuration includes a second operating parameter of the detector; and

combining adjusting one of the first and second output signals based on a relationship between the first and second parameters to obtain a representation of the identifiable signals wherein the representation of the identifiable signals includes effective representations of the first and second types of the specific particles to thereby allow improved identification of the specific particles within the sample.

21.   (Original) The method of Claim 20, wherein the first measurement at the first configuration is adapted to effectively measure a relatively strong component of the identifiable signals associated with the first type of the specific particles having a relatively high abundance.

22.   (Original) The method of Claim 21, wherein the second measurement at the second configuration is adapted to effectively measure a relatively weak component of the

identifiable signals associated with the second type of the specific particles having a relatively low abundance.

23. (Currently amended) The method of Claim 22, wherein ~~combining~~ adjusting one of the first and second output signals comprises scaling the first output signal to a scale associated with the second configuration such that the based on the second configuration, the weak component is effectively measured and the strong component is effectively represented based on the scaling of the effectively measured value from the first configuration.

24. (Original) The method of Claim 23, wherein the scaling of the strong component allows effective representation of both weak and strong components when a dynamic range associated with the detector is limited and would not be able to measure the strong component at the second configuration.

25. (Original) The method of Claim 24, wherein the detector is a charge-coupled device and the first configuration comprises a short exposure duration T1 selected to effectively measure the strong component of the identifiable signals.

26. (Original) The method of Claim 25, wherein the second configuration comprises a long exposure duration T2 selected to effectively measure a weak component of the identifiable signals.

27. (Original) The method of Claim 26, wherein the scaling of the first output signal comprises multiplying the first output signal value by a ratio T2/T1.

28. (Original) The method of Claim 24, wherein the detector is a charge multiplier and the first configuration comprises a low operating voltage V1 selected to effectively measure the strong component of the identifiable signals.

29. (Original) The method of Claim 28, wherein the second configuration comprises a high operating voltage V2 selected to effectively measure a weak component of the identifiable signals.

30. (Original) The method of Claim 29, wherein the scaling of the first output signal comprises determining the scaled value N1' of the first output signal based on a relationship $\log(N1') = m\log(V2/V1)$ where m represents a slope of a curve obtained by plotting the multiplier's gain versus the voltage in a log-log manner.

31.   (Original)   The method of Claim 30, wherein the charge multiplier comprises a photomultiplier tube.

32.   (Original)   The method of Claim 30, wherein the charge multiplier comprises a charge intensifier.

33.   (Original)   A method extending the effective dynamic range of a detector that measures detectable signals from a sample undergoing a biological analysis wherein the detectable signals comprise two or more components representative of two or more components of the sample, the method comprising:

obtaining a first output signal from the detector operated at a first configuration that allows effective measurement of a first component of the detectable signals;

obtaining a second output signal from the detector operated at a second configuration that allows effective measurement of a second component of the detectable signals wherein the second configuration is such that the first component of the detectable signals would fall outside the detector's dynamic range at the second configuration; and

scaling the first output signal to a scale associated with the second configuration wherein the amount of scaling depends on the first and second configurations and wherein the scaled first output signal allows representation of the first output signal at the second configuration thereby extending the effective dynamic range of the detector and wherein such extension of the effective dynamic range allows improved characterization of the sample having a relatively large range of relative abundances of the two or more components.

34.   (Original)   The method of Claim 33, wherein the first configuration is adapted to effectively measure a strong component of the detectable signals.

35.   (Original)   The method of Claim 34, wherein the second configuration is adapted to effectively measure a weak component of the detectable signals.

36.   (Original)   The method of Claim 35, wherein scaling the first output signal allows representation of both weak and strong components when the dynamic range associated with the detector is limited and would not be able to measure the strong component at the second configuration.

37.   (Original)   The method of Claim 36, wherein the detector is a charge-coupled device and the first configuration comprises a short exposure duration T1 selected to effectively measure the strong component of the detectable signals.

38.   (Original) The method of Claim 37, wherein the second configuration comprises a long exposure duration T2 selected to effectively measure a weak component of the detectable signals.

39.   (Original) The method of Claim 38, wherein the scaling of the first output signal comprises multiplying the first output signal value by a ratio T2/T1.

40.   (Original) The method of Claim 36, wherein the detector is a charge multiplier and the first configuration comprises a low operating voltage V1 selected to effectively measure the strong component of the detectable signals.

41.   (Original) The method of Claim 40, wherein the second configuration comprises a high operating voltage V2 selected to effectively measure a weak component of the detectable signals.

42.   (Original) The method of Claim 41, wherein the scaling of the first output signal comprises determining the scaled value N1' of the first output signal based on a relationship $\log(N1') = m\log(V2/V1)$ where m represents a slope of a curve obtained by plotting the multiplier's gain versus the voltage in a log-log manner.

43.   (Original)   The method of Claim 42, wherein the charge multiplier comprises a photomultiplier tube.

44.   (Original)   The method of Claim 42, wherein the charge multiplier comprises a charge intensifier.